

## **ATTACHMENT D.**

### **FIELD CONSTRUCTION COST ESTIMATE WORKSHEETS, PLANS 1-5**

Project: Black Rock Project Assessment  
Feature: Delivery System to Roza Irrigation District  
Details: Plan 1 - Full Exchange High Pressure Pipe  
Beginning Hydraulic Gradeline: 1520 ft.

By: Wendy Christensen

Checked by: John Manfredi

Item	Schedule						Total	
1	Main Pipeline		Steel Pipe Wall Thickness (in) from Table 4-2*					\$32,490,400
2	Length (ft)	Hydraulic (ID) Diameter (in)	AWWA M11	Pounds	Unit Cost of Steel Pipe	Cost		
3	1,000.00	60	0.375	323110.00	\$2.00	\$646,220		
4	14,769.50	60	0.375	4772173.15	\$2.00	\$9,544,346		
5	14,769.50	57	0.3125	3964281.50	\$2.00	\$7,928,563		
6	10,234.11	45	0.25	1860049.49	\$2.00	\$3,720,099		
7	10,234.12	42	0.25	1457952.74	\$2.00	\$2,915,905		
8	6,796.77	33	0.1793	764296.79	\$2.00	\$1,528,594		
9	13,300.00	33	0.1793	861441.00	\$2.00	\$1,722,882		
10	9500	33	0.25	856140.00	\$5.00	\$4,280,700		
11	9,140.00	12	0.075	101545.40	\$2.00	\$203,091		
12								
13	Turnout and Crossing Pumping Plant 1 (MP7.2)	Quantity	Unit Quantity	Unit Cost	Cost		Total	\$155,000
14	Valves and Manifold	1	L.S.	\$100,000	\$100,000			
15	Main Pipe 12" dia crossing under plant	80	I.f.	\$250	\$20,000			
16	Civil, Electrical	1	L.S.	\$35,000	\$35,000			
17								
18	Turnout and Crossing Terrace Heights Pumping Plant	Quantity	Unit Quantity	Unit Cost	Cost		Total	\$116,000
19	Valves and Manifold	1	L.S.	\$60,000	\$60,000			
20	Main Pipe 33" dia crossing under plant	80	I.f.	\$450	\$36,000			
21	Civil, Electrical	1	L.S.	\$20,000	\$20,000			
22								
23	Turnout and Crossing Pumping Plant 2 (MP16.8)	Quantity	Unit Quantity	Unit Cost	Cost		Total	\$308,500
24								
25	Flow rate and PRV Valve w/ CheckValve feature - 16"	5	ea	\$15,000.00	\$75,000			
26	Butterfly Valve - 16"	10	ea	\$3,000.00	\$30,000			
27	Manifold Piping - 16" to 36" dia. Steel pipe	25000	lb.	\$1.50	\$37,500			
28	Manifold Fabrication	25000	lb.	\$2.00	\$50,000			
29	Concrete slab and encasement	30	cy	\$600.00	\$18,000			
30	Earthwork/site work	1	L.S.	\$5,000.00	\$5,000			
31	Electrical/Control system	1	L.S.	\$20,000.00	\$20,000			
32	Fence	1	L.S.	\$3,000.00	\$3,000			
33	Main Pipe 45" dia crossing under plant	100	I.f.	\$700.00	\$70,000			
34								
35	Turnout and Crossing Pumping Plant 3 (MP 22.5)	Quantity	Unit Quantity	Unit Cost	Cost		Total	\$348,500
36								
37	Flow rate and PRV Valve w/ CheckValve feature - 16"	5	ea	\$15,000.00	\$75,000			
38	Butterfly Valve - 16"	10	ea	\$3,000.00	\$30,000			
39	Manifold Piping - 16" to 36" dia. Steel pipe	25000	lb.	\$1.50	\$37,500			
40	Manifold Fabrication	25000	lb.	\$2.00	\$50,000			
41	Concrete slab and encasement	30	cy	\$600.00	\$18,000			
42	Earthwork/site work	1	L.S.	\$5,000.00	\$5,000			
43	Electrical/Control system	1	L.S.	\$20,000.00	\$20,000			
44	Fence	1	L.S.	\$3,000.00	\$3,000			
45	Main Pipe 60" dia crossing under plant	100	I.f.	\$1,100.00	\$110,000			
46								
47	Earthwork (CY)							
48	Excavation						Total	\$2,543,292
49	Diameter	Length	Unit Quantity	Quantity	Unit Cost	Cost		
50	60	1,000.00	8.47	8,470	\$5.00	\$42,350		
51	60	14,769.50	8.47	125,098	\$5.00	\$625,488		
52	57	14,769.50	8.01	118,318	\$5.00	\$591,592		
53	45	10,234.11	6.31	64,587	\$5.00	\$322,937		
54	42	10,234.12	5.92	60,555	\$5.00	\$302,776		
55	33	6,796.77	4.81	32,706	\$5.00	\$163,530		
56	33	13,300.00	4.81	64,000	\$5.00	\$319,998		
57	12	9,140.00	3.82	34,924	\$5.00	\$174,620		
58	Total							
59								
60	Bedding						Total	\$214,919

61	Diameter	Length	Unit Quantity	Quantity	Unit Cost	Cost		
62	60	1,000.00	0.16	164	\$25.00	\$4,100		
63	60	14,769.50	0.16	2,422	\$25.00	\$60,555		
64	57	14,769.50	0.16	2,334	\$25.00	\$58,340		
65	45	10,234.11	0.09	921	\$25.00	\$23,027		
66	42	10,234.12	0.09	890	\$25.00	\$22,259		
67	33	6,796.77	0.08	517	\$25.00	\$12,914		
68	33	13,300.00	0.08	1,011	\$25.00	\$25,270		
69	12	9,140.00	0.04	338	\$25.00	\$8,455		
70								
71	Embedment (.7)						Total	\$1,987,141
72	Diameter	Length	Unit Quantity	Quantity	Unit Cost	Cost		
73	60	1,000.00	1.52	1,524	\$25.00	\$38,100		
74	60	14,769.50	1.52	22,509	\$25.00	\$562,718		
75	57	14,769.50	1.40	20,736	\$25.00	\$518,409		
76	45	10,234.11	0.97	9,937	\$25.00	\$248,433		
77	42	10,234.12	0.87	8,945	\$25.00	\$223,616		
78	33	6,796.77	0.61	4,153	\$25.00	\$103,821		
79	33	13,300.00	0.61	8,126	\$25.00	\$203,158		
80	12	9,140.00	0.39	3,555	\$25.00	\$88,887		
81								
82								
83	Compacted Backfill						Total	\$2,227,926
84	Diameter	Length	Unit Quantity	Quantity	Unit Cost	Cost		
85	60	1,000.00	5.79	5,790	\$6.00	\$34,740		
86	60	14,769.50	5.79	85,515	\$6.00	\$513,092		
87	57	14,769.50	5.56	82,045	\$6.00	\$492,267		
88	45	10,234.11	4.65	47,548	\$6.00	\$285,286		
89	42	10,234.12	4.43	45,306	\$6.00	\$271,839		
90	33	6,796.77	3.79	25,739	\$6.00	\$154,436		
91	33	13,300.00	3.79	50,367	\$6.00	\$302,203		
92	12	9,140.00	3.17	29,010	\$6.00	\$174,062		
93								
94								
95	Farm Turnout Tees and Valves						Total	\$59,250
96	Size	Quantity	Unit Cost	Cost				
97	in	ea	\$/ea	\$				
98	14 (PP#1, MP 7.2)	1	\$3,000.00	\$3,000.00				
99	8	3	\$1,385.00	\$4,155.00				
100	6	12	\$1,150.00	\$13,800.00				
101	4	19	\$905.00	\$17,195.00				
102	2	3	\$700.00	\$2,100.00				
103	Installation	38	\$500.00	\$19,000.00				
104								
105	PRV and Valve Vaults						Total	\$589,000
106	Size	Quantity	Unit Cost	Cost				
107	in	ea	\$/ea	\$				
108	14 (PP#1, MP 7.2)	1	\$30,000.00	\$30,000.00				
109	8	3	\$17,000.00	\$51,000.00				
110	6	12	\$14,000.00	\$168,000.00				
111	4	19	\$12,000.00	\$228,000.00				
112	2	3	\$12,000.00	\$36,000.00				
113	Installation	38	\$2,000.00	\$76,000.00				
114								
115								
116	Flow Meters and Precast Vaults						Total	\$200,500
117	Size	Quantity	Unit Cost	Cost				
118	in	ea	\$/ea	\$				
119	10 (PP #1, MP 7.2)	1	\$7,000.00	\$7,000.00				
120	8	3	\$5,500.00	\$16,500.00				
121	6	12	\$4,500.00	\$54,000.00				
122	4	19	\$4,000.00	\$76,000.00				
123	2	3	\$3,000.00	\$9,000.00				
124	Installation	38	\$1,000.00	\$38,000.00				
125								
126	Steel Pipe Xings for Turnouts						Total	\$564,000
127	Size	Quantity	Unit Cost	Cost				
128	Steel Pipe Xings - 10"	3	\$18,000.00	\$54,000.00				
129	Steel Pipe Xings - 6"	34	\$15,000.00	\$510,000.00				
130								
131	Road crossings	Quantity	Unit Cost	Cost			Total	\$190,000
132	Hwy 24	1	L.S.	\$30,000.00				
133	34+00	1	L.S.	\$10,000.00				
134	147+00	1	L.S.	\$10,000.00				
135	178+00	1	L.S.	\$10,000.00				
136	210+00	1	L.S.	\$10,000.00				
137	263+00	1	L.S.	\$10,000.00				
138	404+00	1	L.S.	\$10,000.00				
139	422+50	1	L.S.	\$10,000.00				
140	441+00	1	L.S.	\$10,000.00				
141	450+00	1	L.S.	\$10,000.00				
142	467+00	1	L.S.	\$10,000.00				
143	484+00 - Terrace Height Blvd.	1	L.S.	\$30,000.00				

144	495+00	1	L.S.	\$10,000.00				
145	508+00	1	L.S.	\$10,000.00				
146	837+00	1	L.S.	\$10,000.00				
147								
148								
149								
150	Special Structures							
151	Access Manholes, Airvalves (every 2000')	40	ea	\$7,000.00			Total	\$280,000
152								
153	Fence Replacement	70000	l.f.	\$3.00			Total	\$210,000
154								
155								
156								
157								
158								
159								
160	SCADA	L.S.	\$250,000.00				Total	\$250,000
161								
162	Subtotal w/o Mobilization							\$42,734,428
163	Mobilization 5%							\$2,100,000
164	Subtotal w/ Mobilization							\$44,834,428
165	Unlisted 15%							\$6,725,164
166	CONTRACT COST							\$52,000,000
167	Construction Contingences 25%							\$13,000,000
168	FIELD COST							\$65,000,000
169								
170								
171	Right-of-Way	100	acres	\$2,500.00			Total	\$250,000
172								
173								
174								

#### MAINLINE PRESSURE REDUCING STATION

		Quantity	Unit Cost	Cost			Total	\$764,000
190	40" Tytan valve	2	\$150,000.00	\$300,000.00				
191	24" Tytan valve	1	\$25,000.00	\$25,000.00				
192	24" Pressure Relief Valve	1	\$25,000.00	\$25,000.00				
193	Control System		Lump Sum	\$75,000.00				
194	42" Isolation Vavles	4	\$24,000.00	\$96,000.00				
195	24" Isolation Vavles	2	\$9,000.00	\$18,000.00				
196	Manifold		Lump Sum	\$150,000.00				
197	Structure		Lump Sum	\$75,000.00				
198	Subtotal w/o Mobilization							\$764,000
199	Mobilization 5%							\$38,000
200	Subtotal w/ Mobilization							\$800,000
201	Unlisted 15%							\$120,000
202	CONTRACT COST							\$900,000
203	Construction Contingences 25%							\$225,000
204	FIELD COST							\$1,100,000
205								
206								
207								
208								
209								
210								
211								

Project: Black Rock Project Assessment

Feature: Delivery System to Roza Irrigation District

\ - Full Exchange High Pressure Pipe with Pumping Plant at Roza Canal

1	Pumping Plant - 14,000 hp							\$6,000,000
2	Subtotal from Plan 1 (line 161, above)							\$42,734,428
3								
4	Revised Subtotal w/o Mobilization							\$48,734,428
5	Mobilization 5%							\$2,400,000
6	Revised Subtotal w/ Mobilization							\$51,134,428
7	Unlisted 15%							\$7,670,164
8	CONTRACT COST							\$59,000,000
9	Construction Contingences 25%							\$14,750,000
10	FIELD COST							\$74,000,000
11								
12								
13	Right-of-Way	100	acres	\$2,500.00			Total	\$250,000
14								
15								

Project: Black Rock Project Assessment  
Feature: Delivery System to Roza Irrigation District  
Details: Plan 2 - High Pressure Pipe  
Beginning Hydraulic Gradeline: 1515 ft.

By: Wendy Christensen

Checked by: John Manfredi

Item	Schedule						Total	
1	Main Pipeline		Steel Pipe Wall Thickness (in) from Table 4-2* AWWA M11					\$11,954,557
2	Length (ft)	Hydraulic (ID) Diameter (in)		Pounds	Unit Cost of Steel Pipe	Cost		
3	1,000.00	60	0.3750	241830	\$2.00	\$483,660		
4	14,769.50	51	0.3125	2529719.96	\$2.00	\$5,059,440		
5	14,769.50	48	0.3125	2381729.57	\$2.00	\$4,763,459		
6	10,234.11	27	0.1563	475783.7739	\$2.00	\$951,568		
7	10,234.12	18	0.1046	227504.49	\$2.00	\$455,009		
8	6,796.77	15	0.1046	120710.64	\$2.00	\$241,421		
9								
10								
11								
12								
13								
14								
15	Turnout and Crossing Pumping Plant Terrace Heights	Quantity	Unit Quantity	Unit Cost	Cost		Total	\$104,000
16	Valves and Manifold	1	L.S.	\$60,000.00	\$60,000.00			
17	Main Pipe 18" dia crossing under plant	80	I.f.	\$300.00	\$24,000.00			
18	Civil, Electrical	1	L.S.	\$20,000.00	\$20,000.00			
19								
20	Turnout and Crossing Pumping Plant 2 (MP16.8)	Quantity	Unit Quantity	Unit Cost	Cost		Total	\$278,500
21								
22	Flow rate and PRV Valve w/ CheckValve feature - 16"	5	ea	\$15,000.00	\$75,000.00			
23	Butterfly Valve - 16"	10	ea	\$3,000.00	\$30,000.00			
24	Manifold Piping - 16" to 36" dia. Steel pipe	25000	lb.	\$1.50	\$37,500.00			
25	Manifold Fabrication	25000	lb.	\$2.00	\$50,000.00			
26	Concrete slab and encasement	30	cy	\$600.00	\$18,000.00			
27	Earthwork/sitework	1	L.S.	\$5,000.00	\$5,000.00			
28	Electrical/Control system	1	L.S.	\$20,000.00	\$20,000.00			
29	Fence	1	L.S.	\$3,000.00	\$3,000.00			
30	Main Pipe 27" dia crossing under plant	100	I.f.	\$400.00	\$40,000.00			
31								
32	Turnout and Crossing Pumping Plant 3 (MP 22.5)	Quantity	Unit Quantity	Unit Cost	Cost		Total	\$333,500
33								
34	Flow rate and PRV Valve w/ CheckValve feature - 16"	5	ea	\$15,000.00	\$75,000.00			
35	Butterfly Valve - 16"	10	ea	\$3,000.00	\$30,000.00			
36	Manifold Piping - 16" to 36" dia. Steel pipe	25000	lb.	\$1.50	\$37,500.00			
37	Manifold Fabrication	25000	lb.	\$2.00	\$50,000.00			
38	Concrete slab and encasement	30	cy	\$600.00	\$18,000.00			
39	Earthwork/sitework	1	L.S.	\$5,000.00	\$5,000.00			
40	Electrical/Control system	1	L.S.	\$20,000.00	\$20,000.00			
41	Fence	1	L.S.	\$3,000.00	\$3,000.00			
42	Main Pipe 51" dia crossing under plant	100	I.f.	\$950.00	\$95,000.00			
43								
44	Earthwork (CY)							
45	Excavation						Total	\$1,602,519
46	Diameter	Length	Unit Quantity	Quantity	Unit Cost	Cost		
47	60	1,000.00	8.47	8,468	\$5.00	\$42,340		
48	51	14,769.50	7.14	105,395	\$5.00	\$526,976		
49	48	14,769.50	6.72	99,207	\$5.00	\$496,034		
50	27	10,234.11	4.14	42,359	\$5.00	\$211,795		
51	18	10,234.12	3.82	39,105	\$5.00	\$195,523		
52	15	6,796.77	3.82	25,970	\$5.00	\$129,852		
53								
54								
55	Total							
56								
57	Bedding						Total	\$114,170
58	Diameter	Length	Unit Quantity	Quantity	Unit Cost	Cost		
59	60	1,000.00	0.16	164	\$25.00	\$4,100		

60	51	14,769.50	0.10	1,433	\$25.00	\$35,816		
61	48	14,769.50	0.09	1,388	\$25.00	\$34,708		
62	27	10,234.11	0.07	706	\$25.00	\$17,654		
63	18	10,234.12	0.06	604	\$25.00	\$15,095		
64	15	6,796.77	0.04	272	\$25.00	\$6,797		
65								
66								
67								
68	Embedment (.7)						Total	\$1,151,690
69	Diameter	Length	Unit Quantity	Quantity	Unit Cost	Cost		
70	60	1,000.00	1.52	1,524	\$25.00	\$38,100		
71	51	14,769.50	1.18	17,398	\$25.00	\$434,962		
72	48	14,769.50	1.07	15,833	\$25.00	\$395,823		
73	27	10,234.11	0.46	4,687	\$25.00	\$117,181		
74	18	10,234.12	0.39	3,981	\$25.00	\$99,527		
75	15	6,796.77	0.39	2,644	\$25.00	\$66,099		
76								
77								
78								
79								
80	Compacted Backfill						Total	\$1,449,208
81	Diameter	Length	Unit Quantity	Quantity	Unit Cost	Cost		
82	60	1,000.00	5.79	5,790	\$6.00	\$34,740		
83	51	14,769.50	5.09	75,236	\$6.00	\$451,415		
84	48	14,769.50	4.87	71,913	\$6.00	\$431,476		
85	27	10,234.11	3.38	34,540	\$6.00	\$207,241		
86	18	10,234.12	3.17	32,483	\$6.00	\$194,899		
87	15	6,796.77	3.17	21,573	\$6.00	\$129,438		
88								
89								
90								
91								
92	Farm Turnout Tees and Valves						Total	\$43,515
93	Size	Quantity	Unit Cost	Cost				
94	in	ea	\$/ea	\$				
95								
96	8	3	\$1,385.00	\$4,155.00				
97	6	12	\$1,150.00	\$13,800.00				
98	4	12	\$905.00	\$10,860.00				
99	2	1	\$700.00	\$700.00				
100	Installation	28	\$500.00	\$14,000.00				
101								
102	PRV and Valve Vaults						Total	\$431,000
103	Size	Quantity	Unit Cost	Cost				
104	in	ea	\$/ea	\$				
105								
106	8	3	\$17,000.00	\$51,000.00				
107	6	12	\$14,000.00	\$168,000.00				
108	4	12	\$12,000.00	\$144,000.00				
109	2	1	\$12,000.00	\$12,000.00				
110	Installation	28	\$2,000.00	\$56,000.00				
111								
112								
113	Flow Meters and Precast Vaults						Total	\$149,500
114	Size	Quantity	Unit Cost	Cost				
115	in	ea	\$/ea	\$				
116								
117	8	3	\$5,500.00	\$16,500.00				
118	6	12	\$4,500.00	\$54,000.00				
119	4	12	\$4,000.00	\$48,000.00				
120	2	1	\$3,000.00	\$3,000.00				
121	Installation	28	\$1,000.00	\$28,000.00				
122								
123	Steel Pipe Xings for Turnouts						Total	\$429,000
124	Size	Quantity	Unit Cost	Cost				
125	Steel Pipe Xings - 10"	3	\$18,000.00	\$54,000.00				
126	Steel Pipe Xings - 6"	25	\$15,000.00	\$375,000.00				
127								
128	Road crossings	Quantity	Unit Cost	Cost			Total	\$180,000
129	Hwy 24	1	L.S.	\$30,000.00				
130	34+00	1	L.S.	\$10,000.00				
131	147+00	1	L.S.	\$10,000.00				
132	178+00	1	L.S.	\$10,000.00				
133	210+00	1	L.S.	\$10,000.00				
134	263+00	1	L.S.	\$10,000.00				
135	404+00	1	L.S.	\$10,000.00				
136	422+50	1	L.S.	\$10,000.00				
137	441+00	1	L.S.	\$10,000.00				
138	450+00	1	L.S.	\$10,000.00				
139	467+00	1	L.S.	\$10,000.00				

140	484+00 - Terrace Height Blvd.	1	L.S.	\$30,000.00				
141	495+00	1	L.S.	\$10,000.00				
142	508+00	1	L.S.	\$10,000.00				
143								
144								
145								
146								
147	Special Structures							
148	Access Manholes, Airvalves (every 2000')	30	ea	\$7,000.00			Total	\$210,000
149								
150	Fence Replacement	50000	l.f.	\$3.00			Total	\$150,000
151								
152								
153								
154								
155								
156								
157	SCADA	L.S.	\$200,000.00				Total	\$200,000
158								
159	Subtotal w/o Mobilization							\$18,781,160
160	Mobilization 5%							\$940,000
161	Subtotal w/ Mobilization							\$19,721,160
162	Unlisted 15%							\$2,958,174
163	CONTRACT COST							\$23,000,000
164	Construction Contingences 25%							\$5,750,000
165	FIELD COST							\$29,000,000
166								
167								
168	Right-of-Way	90	acres	\$2,500.00			Total	\$225,000
169								
170								
171								

#### MAINLINE PRESSURE REDUCING STATION

		Quantity	Unit Cost	Cost			Total	\$764,000
190	40" Tytan valve	2	\$150,000.00	\$300,000.00				
191	24" Tytan valve	1	\$25,000.00	\$25,000.00				
192	24" Pressure Relief Valve	1	\$25,000.00	\$25,000.00				
193	Control System		Lump Sum	\$75,000.00				
194	42" Isolation Vavles	4	\$24,000.00	\$96,000.00				
195	24" Isolation Vavles	2	\$9,000.00	\$18,000.00				
196	Manifold		Lump Sum	\$150,000.00				
197	Structure		Lump Sum	\$75,000.00				
198	Subtotal w/o Mobilization							\$764,000
199	Mobilization 5%							\$38,000
200	Subtotal w/ Mobilization							\$800,000
201	Unlisted 15%							\$120,000
202	CONTRACT COST							\$900,000
203	Construction Contingences 25%							\$225,000
204	FIELD COST							\$1,100,000
205								
206								
207								
208								
209								
210								
211								

Project: Black Rock Project Assessment  
Feature: Delivery System to Roza Irrigation District  
Plan 2-A - High Pressure Pipe with Pumping Plant at Roza Canal

1	Pumping Plant - 12,000 hp							\$5,250,000.00
2	ubtotal from Plan 2 (line 158, above)							\$18,781,160.15
3								
4	Revised Subtotal w/o Mobilization							\$24,031,160.15
5	Mobilization 5%							\$1,200,000.00
6	Revised Subtotal w/ Mobilization							\$25,231,160.15
7	Unlisted 15%							\$3,784,674.02
8	CONTRACT COST							\$29,000,000.00
9	Construction Contingences 25%							\$7,250,000.00
10	FIELD COST							\$36,000,000.00
11								
12								
13	Right-of-Way	90	acres	\$2,500.00			Total	\$225,000.00
14								

**Project: Black Rock Project Assessment**  
**Feature: Delivery System to Roza Irrigation District**  
**Details: Plan 3 - Low Pressure Pipe**  
**Beginning Hydraulic Grade Line: 1270 ft.**

By: Wendy Christensen

Checked by: John Manfredi

Item	Schedule						Total	
1	Main Pipeline							\$11,545,821
			<b>Steel Pipe Wall Thickness (in) from Table 4-2* AWWA M11</b>		<b>Unit Cost of Steel Pipe</b>	<b>Cost</b>		
2	<b>Length (ft)</b>	<b>Hydraulic (ID) Diameter (in)</b>		<b>Pounds</b>				
3	1,000.00	60	0.25	160,890.00	\$2.00	321,780		
4	14,769.50	60	0.25	2,376,264.86	\$2.00	4,752,530		
5	14,769.50	60	0.25	2,376,264.86	\$2.00	4,752,530		
6	10,234.11	30	0.1046	364,743.68	\$2.00	729,487		
7	10,234.12	27	0.1046	341,819.61	\$2.00	683,639		
8	6,796.77	24	PVC		\$45.00	305,855		
9								
10								
11								
12								
13								
14								
15	Turnout and Crossing Pumping Plant Terrace Heights	Quantity	Unit Quantity	Unit Cost	Cost		Total	\$113,800
16	Valves and Manifold	1	L.S.	\$60,000.00	\$60,000.00			
17	Main Pipe 24" dia crossing under plant	80	l.f.	\$360.00	\$28,800.00			
18	Civil, Electrical	1	L.S.	\$25,000.00	\$25,000.00			
19								
20	Turnout and Crossing Pumping Plant 2 (MP16.8)	Quantity	Unit Quantity	Unit Cost	Cost		Total	\$256,000
21								
22	Flow rate and PRV Valve w/ Check Valve feature - 16"	5	ea	\$15,000.00	\$75,000.00			
23	Butterfly Valve - 16"	10	ea	\$3,000.00	\$30,000.00			
24	Manifold Piping - 16" to 36" dia. Steel pipe	18,000	lb.	\$1.50	\$27,000.00			
25	Manifold Fabrication	18,000	lb.	\$2.00	\$36,000.00			
26	Concrete slab and encasement	30	cy	\$600.00	\$18,000.00			
27	Earthwork/site work	1	L.S.	\$5,000.00	\$5,000.00			
28	Electrical/Control system	1	L.S.	\$20,000.00	\$20,000.00			
29	Fence	1	L.S.	\$3,000.00	\$3,000.00			
30	Main Pipe 30" dia crossing under plant	100	l.f.	\$420.00	\$42,000.00			
31								
32	Turnout and Crossing Pumping Plant 3 (MP 22.5)	Quantity	Unit Quantity	Unit Cost	Cost		Total	\$318,000
33								
34	Flow rate and PRV Valve w/ Check Valve feature - 16"	5	ea	\$15,000.00	\$75,000.00			
35	Butterfly Valve - 16"	10	ea	\$3,000.00	\$30,000.00			
36	Manifold Piping - 16" to 36" dia. Steel pipe	18,000	lb.	\$1.50	\$27,000.00			
37	Manifold Fabrication	18,000	lb.	\$2.00	\$36,000.00			
38	Concrete slab and encasement	20	cy	\$600.00	\$12,000.00			
39	Earthwork/site work	1	L.S.	\$5,000.00	\$5,000.00			
40	Electrical/Control system	1	L.S.	\$20,000.00	\$20,000.00			
41	Fence	1	L.S.	\$3,000.00	\$3,000.00			
42	Main Pipe 60" dia crossing under plant	100	l.f.	\$1,100.00	\$110,000.00			
43								
44	Earthwork (CY)							
45	Excavation						Total	\$1,863,350
46	Diameter	Length	Unit Quantity	Quantity	Unit Cost	Cost		
47	60	1,000.00	8.47	8,468	\$5.00	42,340		
48	60	14,769.50	8.47	125,068	\$5.00	625,341		
49	60	14,769.50	8.47	125,068	\$5.00	625,341		
50	30	10,234.11	4.47	45,736	\$5.00	228,681		
51	27	10,234.12	4.14	42,359	\$5.00	211,795		
52	24	6,796.77	3.82	25,970	\$5.00	129,852		
53								
54								
55	Total							
56								
57	Bedding						Total	\$172,330
58	Diameter	Length	Unit Quantity	Quantity	Unit Cost	Cost		
59	60	1,000.00	0.16	164	\$25.00	4,100		
60	60	14,769.50	0.16	2,422	\$25.00	60,555		



61	60	14,769.50	0.16	2,422	\$25.00	60,555		
62	30	10,234.11	0.07	737	\$25.00	18,421		
63	27	10,234.12	0.07	706	\$25.00	17,654		
64	24	6,796.77	0.07	442	\$25.00	11,045		
65								
66								
67								
68	Embedment (.7)						Total	\$1,482,929
69	Diameter	Length	Unit Quantity	Quantity	Unit Cost	Cost		
70	60	1,000.00	1.52	1,524	\$25.00	38,100		
71	60	14,769.50	1.52	22,509	\$25.00	562,718		
72	60	14,769.50	1.52	22,509	\$25.00	562,718		
73	30	10,234.11	0.53	5,445	\$25.00	136,114		
74	27	10,234.12	0.46	4,687	\$25.00	117,181		
75	24	6,796.77	0.39	2,644	\$25.00	66,099		
76								
77								
78								
79								
80	Compacted Backfill						Total	\$1,617,432
81	Diameter	Length	Unit Quantity	Quantity	Unit Cost	Cost		
82	60	1,000.00	5.79	5,790	\$6.00	34,740		
83	60	14,769.50	5.79	85,515	\$6.00	513,092		
84	60	14,769.50	5.79	85,515	\$6.00	513,092		
85	30	10,234.11	3.58	36,638	\$6.00	219,829		
86	27	10,234.12	3.38	34,540	\$6.00	207,241		
87	24	6,796.77	3.17	21,573	\$6.00	129,438		
88								
89								
90								
91								
92	Farm Turnout Tees and Valves						Total	\$43,515
93	Size	Quantity	Unit Cost	Cost				
94	in	ea	\$/ea	\$				
95								
96	8	3	\$1,385.00	\$4,155.00				
97	6	12	\$1,150.00	\$13,800.00				
98	4	12	\$905.00	\$10,860.00				
99	2	1	\$700.00	\$700.00				
100	Installation	28	\$500.00	\$14,000.00				
101								
102	PRV and Valve Vaults						Total	\$431,000
103	Size	Quantity	Unit Cost	Cost				
104	in	ea	\$/ea	\$				
105								
106	8	3	\$17,000.00	\$51,000.00				
107	6	12	\$14,000.00	\$168,000.00				
108	4	12	\$12,000.00	\$144,000.00				
109	2	1	\$12,000.00	\$12,000.00				
110	Installation	28	\$2,000.00	\$56,000.00				
111								
112								
113	Flow Meters and Precast Vaults						Total	\$149,500
114	Size	Quantity	Unit Cost	Cost				
115	in	ea	\$/ea	\$				
116								
117	8	3	\$5,500.00	\$16,500.00				
118	6	12	\$4,500.00	\$54,000.00				
119	4	12	\$4,000.00	\$48,000.00				
120	2	1	\$3,000.00	\$3,000.00				
121	Installation	28	\$1,000.00	\$28,000.00				
122								
123	Steel Pipe Xings for Turnouts						Total	\$429,000
124	Size	Quantity	Unit Cost	Cost				
125	Steel Pipe Xings - 10"	3	\$18,000.00	\$54,000.00				
126	Steel Pipe Xings - 6"	25	\$15,000.00	\$375,000.00				
127								
128	Road crossings	Quantity	Unit Cost	Cost			Total	\$180,000
129	Hwy 24	1	L.S.	\$30,000.00				
130	34+00	1	L.S.	\$10,000.00				
131	147+00	1	L.S.	\$10,000.00				
132	178+00	1	L.S.	\$10,000.00				
133	210+00	1	L.S.	\$10,000.00				
134	263+00	1	L.S.	\$10,000.00				
135	404+00	1	L.S.	\$10,000.00				
136	422+50	1	L.S.	\$10,000.00				
137	441+00	1	L.S.	\$10,000.00				
138	450+00	1	L.S.	\$10,000.00				
139	467+00	1	L.S.	\$10,000.00				
140	484+00 - Terrace Height Blvd.	1	L.S.	\$30,000.00				
141	495+00	1	L.S.	\$10,000.00				

142	508+00	1	L.S.	\$10,000.00				
143								
144								
145								
146								
147	Special Structures							
148	Access Manholes, Airvalves (every 2000')	30	ea	\$7,000.00			Total	\$210,000
149								
150	Fence Replacement	50000	l.f.	\$3.00			Total	\$150,000
151								
152								
153								
154								
155								
156								
157	SCADA	L.S.		\$200,000.00			Total	\$200,000
158								
159	Subtotal w/o Mobilization							\$19,162,676
160	Mobilization 5%							\$960,000
161	Subtotal w/ Mobilization							\$20,122,676
162	Unlisted 15%							\$3,018,401
163	CONTRACT COST							\$23,000,000
164	Construction Contingences 25%							\$5,750,000
165	FIELD COST							\$29,000,000
166								
167								
168	Right-of-Way	90	acres	\$2,500.00			Total	\$225,000
169								
170								
171								

MAINLINE PRESSURE REDUCING STATION

		Quantity	Unit Cost	Cost			Total	\$764,000
190	40" Tytan valve	2	\$150,000.00	\$300,000.00				
191	24" Tytan valve	1	\$25,000.00	\$25,000.00				
192	24" Pressure Relief Valve	1	\$25,000.00	\$25,000.00				
193	Control System		Lump Sum	\$75,000.00				
194	42" Isolation Vavles	4	\$24,000.00	\$96,000.00				
195	24" Isolation Vavles	2	\$9,000.00	\$18,000.00				
196	Manifold		Lump Sum	\$150,000.00				
197	Structure		Lump Sum	\$75,000.00				
198	Subtotal w/o Mobilization							\$764,000
199	Mobilization 5%							\$38,000
200	Subtotal w/ Mobilization							\$800,000
201	Unlisted 15%							\$120,000
202	CONTRACT COST							\$900,000
203	Construction Contingences 25%							\$225,000
204	FIELD COST							\$1,100,000
205								
206								
207								
208								
209								
210								
211								

Project: Black Rock Project Assessment  
Feature: Delivery System to Roza Irrigation District  
Plan 3-A - Low Pressure Pipe with Pumping Plant at Roza Canal

1	Pumping Plant - 3,300 hp							\$2,000,000
2	Subtotal from Plan 3 (line 158, above)							\$19,162,676
3								
4	Revised Subtotal w/o Mobilization							\$21,162,676
5	Mobilization 5%							\$1,100,000
6	Revised Subtotal w/ Mobilization							\$22,262,676
7	Unlisted 15%							\$3,339,401
8	CONTRACT COST							\$26,000,000
9	Construction Contingences 25%							\$6,500,000
10	FIELD COST							\$33,000,000
11								
12								
13	Right-of-Way	90	acres	\$2,500.00			Total	\$225,000
14								
15								
16								

Project: Black Rock Project Assessment  
 Feature: Delivery System to Roza Irrigation District  
 Plan 4 - Low Pressure Pipe Roza, Selah-Moxee and Union Gap  
 Beginning Hydraulic Grade Line: 1330 ft.

By: Wendy Christensen

Checked by: John Manfredi

Item	Schedule						Total	\$26,508,271
1	Main Pipeline							
			Steel Pipe Wall Thickness (in) from Table 4-2*					
2	Length (ft)	Hydraulic (ID) Diameter (in)	AWWA M11	Pounds	Pounds	Cost		
3	1,000.00	78	0.31	261,400.00	\$2.00	\$522,800		
4	14,769.50	78	0.31	3,860,747.30	\$2.00	\$7,721,495		
5	14,769.50	75	0.31	3,712,904.61	\$2.00	\$7,425,809		
6	10,234.11	63	0.31	2,162,774.47	\$2.00	\$4,325,549		
7	10,234.12	63	0.31	2,162,776.58	\$2.00	\$4,325,553		
8	6,796.77	60	0.25	1,093,532.33	\$2.00	\$2,187,065		
9								
10								
11								
12								
13								
14								
15	Turnout and Crossing Pumping Plant Terrace Heights	Quantity	Unit Quantity	Unit Cost	Cost		Total	\$168,000
16	Valves and Manifold	1	L.S.	\$60,000.00	\$60,000.00			
17	Main Pipe 60" dia crossing under plant	80	I.f.	\$1,100.00	\$88,000.00			
18	Civil, Electrical	1	L.S.	\$20,000.00	\$20,000.00			
19								
20	Turnout and Crossing Pumping Plant 2 (MP16.8)	Quantity	Unit Quantity	Unit Cost	Cost		Total	\$334,000
21								
22	Flow rate and PRV Valve w/ Check Valve feature - 16"	5	ea	\$15,000.00	\$75,000.00			
23	Butterfly Valve - 16"	10	ea	\$3,000.00	\$30,000.00			
24	Manifold Piping - 16" to 36" dia. Steel pipe	18,000	lb.	\$1.50	\$27,000.00			
25	Manifold Fabrication	18,000	lb.	\$2.00	\$36,000.00			
26	Concrete slab and encasement	30	cy	\$600.00	\$18,000.00			
27	Earthwork/site work	1	L.S.	\$5,000.00	\$5,000.00			
28	Electrical/Control system	1	L.S.	\$20,000.00	\$20,000.00			
29	Fence	1	L.S.	\$3,000.00	\$3,000.00			
30	Main Pipe 63" dia crossing under plant	100	I.f.	\$1,200.00	\$120,000.00			
31								
32	Turnout and Crossing Pumping Plant 3 (MP 22.5)	Quantity	Unit Quantity	Unit Cost	Cost		Total	\$349,000
33								
34	Flow rate and PRV Valve w/ Check Valve feature - 16"	5	ea	\$15,000.00	\$75,000.00			
35	Butterfly Valve - 16"	10	ea	\$3,000.00	\$30,000.00			
36	Manifold Piping - 16" to 36" dia. Steel pipe	18,000	lb.	\$1.50	\$27,000.00			
37	Manifold Fabrication	18,000	lb.	\$2.00	\$36,000.00			
38	Concrete slab and encasement	30	cy	\$600.00	\$18,000.00			
39	Earthwork/site work	1	L.S.	\$5,000.00	\$5,000.00			
40	Electrical/Control system	1	L.S.	\$20,000.00	\$20,000.00			
41	Fence	1	L.S.	\$3,000.00	\$3,000.00			
42	Main Pipe 78" dia crossing under plant	100	I.f.	\$1,350.00	\$135,000.00			
43								
44	Earthwork (CY)							
45	Excavation						Total	\$2,915,046
46	Diameter	Length	Unit Quantity	Quantity	Unit Cost	Cost		
47	78	1,000.00	11.47	11,470	\$5.00	\$57,350.00		
48	78	14,769.50	11.47	169,406	\$5.00	\$847,030.83		
49	75	14,769.50	10.94	161,578	\$5.00	\$807,891.65		
50	63	10,234.11	8.94	91,493	\$5.00	\$457,464.72		
51	63	10,234.12	8.94	91,493	\$5.00	\$457,465.16		
52	60	6,796.77	8.47	57,569	\$5.00	\$287,843.21		
53								
54								
55	Total							
56								
57	Bedding						Total	\$262,140
58	Diameter	Length	Unit Quantity	Quantity	Unit Cost	Cost		
59	78	1,000.00	0.20	196	\$25.00	\$4,900		
60	78	14,769.50	0.20	2,895	\$25.00	\$72,371		
61	75	14,769.50	0.19	2,821	\$25.00	\$70,524		
62	63	10,234.11	0.17	1,730	\$25.00	\$43,239		
63	63	10,234.12	0.17	1,730	\$25.00	\$43,239		
64	60	6,796.77	0.16	1,115	\$25.00	\$27,867		
65								
66								

67								
68	Embedment (.7)						Total	\$2,834,644
69	Diameter	Length	Unit Quantity	Quantity	Unit Cost	Cost		
70	78	1,000.00	2.34	2,340	\$25.00	\$58,500		
71	78	14,769.50	2.34	34,561	\$25.00	\$864,016		
72	75	14,769.50	2.19	32,375	\$25.00	\$809,369		
73	63	10,234.11	1.65	16,876	\$25.00	\$421,901		
74	63	10,234.12	1.65	16,876	\$25.00	\$421,902		
75	60	6,796.77	1.52	10,358	\$25.00	\$258,957		
76								
77								
78								
79								
80	Compacted Backfill						Total	\$2,283,720
81	Diameter	Length	Unit Quantity	Quantity	Unit Cost	Cost		
82	78	1,000.00	7.26	7,262	\$6.00	\$43,572		
83	78	14,769.50	7.26	107,256	\$6.00	\$643,537		
84	75	14,769.50	7.00	103,387	\$6.00	\$620,319		
85	63	10,234.11	6.03	61,681	\$6.00	\$370,086		
86	63	10,234.12	6.03	61,681	\$6.00	\$370,086		
87	60	6,796.77	5.79	39,353	\$6.00	\$236,120		
88								
89								
90								
91								
92	Farm Turnout Tees and Valves						Total	\$43,515
93	Size	Quantity	Unit Cost	Cost				
94	in	ea	\$/ea	\$				
95								
96	8	3	\$1,385.00	\$4,155.00				
97	6	12	\$1,150.00	\$13,800.00				
98	4	12	\$905.00	\$10,860.00				
99	2	1	\$700.00	\$700.00				
100	Installation	28	\$500.00	\$14,000.00				
101								
102	PRV and Valve Vaults						Total	\$431,000
103	Size	Quantity	Unit Cost	Cost				
104	in	ea	\$/ea	\$				
105								
106	8	3	\$17,000.00	\$51,000.00				
107	6	12	\$14,000.00	\$168,000.00				
108	4	12	\$12,000.00	\$144,000.00				
109	2	1	\$12,000.00	\$12,000.00				
110	Installation	28	\$2,000.00	\$56,000.00				
111								
112								
113	Flow Meters and Precast Vaults						Total	\$149,500
114	Size	Quantity	Unit Cost	Cost				
115	in	ea	\$/ea	\$				
116								
117	8	3	\$5,500.00	\$16,500.00				
118	6	12	\$4,500.00	\$54,000.00				
119	4	12	\$4,000.00	\$48,000.00				
120	2	1	\$3,000.00	\$3,000.00				
121	Installation	28	\$1,000.00	\$28,000.00				
122								
123	Steel Pipe Xings for Turnouts						Total	\$429,000
124	Size	Quantity	Unit Cost	Cost				
125	Steel Pipe Xings - 10"	3	\$18,000.00	\$54,000.00				
126	Steel Pipe Xings - 6"	25	\$15,000.00	\$375,000.00				
127								
128	Road crossings	Quantity	Unit Cost	Cost			Total	\$180,000
129	Hwy 24	1	L.S.	\$30,000.00				
130	34+00	1	L.S.	\$10,000.00				
131	147+00	1	L.S.	\$10,000.00				
132	178+00	1	L.S.	\$10,000.00				
133	210+00	1	L.S.	\$10,000.00				
134	263+00	1	L.S.	\$10,000.00				
135	404+00	1	L.S.	\$10,000.00				
136	422+50	1	L.S.	\$10,000.00				
137	441+00	1	L.S.	\$10,000.00				
138	450+00	1	L.S.	\$10,000.00				
139	467+00	1	L.S.	\$10,000.00				
140	484+00 - Terrace Height Blvd.	1	L.S.	\$30,000.00				
141	495+00	1	L.S.	\$10,000.00				
142	508+00	1	L.S.	\$10,000.00				
143								
144	ah-Moxee/Union Gap Drop Structure						Total	\$420,360
145	Upstream Shutoff Valve, 36" BFV	2	ea	\$10,000.00	\$20,000.00			
146	Road crossings	3	ea	\$10,000.00	\$30,000.00			
147	Pipe 33" - Union Gap	550	l.f.	\$180.00	\$99,000.00			
148	Pipe 36" - Selah-Moxee	100	l.f.	\$200.00	\$20,000.00			
149	Flow rate and PRV Valve w/ Check Valve feature - 16"	8	ea	\$15,000.00	\$120,000.00			
150	Butterfly Valve - 16"	16	ea	\$2,000.00	\$32,000.00			
151	Manifold Piping - 16" to 36" dia. Steel pipes	15000	lb.	\$3.00	\$45,000.00			

152	Concrete Outlet Boxes	60	cy	\$700.00	\$42,000.00			
153	Safety Racks (6x10)	2800	lb	\$4.00	\$11,200.00			
154	Excavation	100	cy	\$8.00	\$800.00			
155	Compacted Backfill	30	cy	\$12.00	\$360.00			
156								
157								
158								
159								
160								
161	Special Structures							
162	Access Manholes, Airvalves (every 2000')	30	ea	\$7,000.00			Total	\$210,000
163								
164	Fence Replacement	50000	l.f.	\$3.00			Total	\$150,000
165								
166								
167								
168								
169	SCADA	L.S.		\$230,000.00			Total	\$230,000
170								
171	Subtotal w/o Mobilization							\$37,898,195
172	Mobilization 5%							\$1,900,000
173	Subtotal w/ Mobilization							\$39,798,195
174	Unlisted 15%							\$5,969,729
175	CONTRACT COST							\$46,000,000
176	Construction Contingences 25%							\$11,500,000
177	FIELD COST							\$58,000,000
178								
179								
180	Right-of-Way	90	acres	\$2,500.00			Total	\$225,000
181								
182								
183								

#### MAINLINE PRESSURE REDUCING STATION

		Quantity	Unit Cost	Cost			Total	\$1,062,000
190	40" Tytan valve	3	\$150,000.00	\$450,000.00				
191	24" Tytan valve	1	\$25,000.00	\$25,000.00				
192	24" Pressure Relief Valve	1	\$25,000.00	\$25,000.00				
193	Control System		Lump Sum	\$100,000.00				
194	42" Isolation Vavles	6	\$24,000.00	\$144,000.00				
195	24" Isolation Vavles	2	\$9,000.00	\$18,000.00				
196	Manifold		Lump Sum	\$200,000.00				
197	Structure		Lump Sum	\$100,000.00				
198	Subtotal w/o Mobilization							\$1,062,000
199	Mobilization 5%							\$53,000
200	Subtotal w/ Mobilization							\$1,100,000
201	Unlisted 15%							\$165,000
202	CONTRACT COST							\$1,250,000
203	Construction Contingences 25%							\$312,500
204	FIELD COST							\$1,600,000
205								
206								
207								
208								
209								
210								
211								

Project: Black Rock Project Assessment  
Feature: Delivery System to Roza Irrigation District  
Pipe with Selah-Moxee and Union Gap Drop Structure and Pumping Plant at Roza Canal

1	Pumping Plant - 10,500 hp							\$4,750,000
2	Subtotal from Plan 4 (line 170, above)							\$37,898,195
3								
4	Revised Subtotal w/o Mobilization							\$42,648,195
5	Mobilization 5%							\$2,100,000
6	Revised Subtotal w/ Mobilization							\$44,748,195
7	Unlisted 15%							\$6,712,229
8	CONTRACT COST							\$51,000,000
9	Construction Contingences 25%							\$12,750,000
10	FIELD COST							\$64,000,000
11								
12								
13	Right-of-Way	90	acres	\$2,500.00			Total	\$225,000
14								
15								
16								

Project: Black Rock Project Assessment  
Feature: Delivery System to Roza Irrigation District  
an 4-B - High Pressure Pipe Roza, Selah-Moxee and Union Gap  
Beginning Hydraulic Gradeline Elevation: 1778 ft.

By: Wendy Christensen

Checked by: John Manfredi

Item	Schedule						Total	
1	Main Pipeline							\$60,156,634
		Hydraulic (ID) Diameter (in)	Steel Pipe Wall Thickness (in) from Table 4-2* AWWA M11	Pounds	Unit Cost of Steel Pipe	Cost		
2	Length (ft)							
3	1,000.00	78	0.75	630,870.00	\$2.00	\$1,261,740		
4	14,769.50	78	0.75	9,317,634.47	\$2.00	\$18,635,269		
5	14,769.50	75	0.75	8,962,723.38	\$2.00	\$17,925,447		
6	10,234.11	63	0.625	4,346,938.22	\$2.00	\$8,693,876		
7	10,234.12	63	0.625	4,346,942.47	\$2.00	\$8,693,885		
8	6,796.77	60	0.5625	2,473,208.67	\$2.00	\$4,946,417		
9								
10								
11								
12								
13								
14								
15	Turnout and Crossing Pumping Plant Terrace Heights	Quantity	Unit Quantity	Unit Cost	Cost		Total	\$238,000
16	Valves and Manifold	1	L.S.	\$120,000.00	\$120,000.00			
17	Main Pipe 60" dia crossing under plant	80	I.f.	\$1,100.00	\$88,000.00			
18	Civil, Electrical	1	L.S.	\$30,000.00	\$30,000.00			
19								
20								
21	Bifurcation Structure at TH Plant	1	L.S.	\$10,000.00	\$10,000.00		Total	\$10,000
22								
23								
24								
25	Turnout and Crossing Pumping Plant 2 (MP16.8)	Quantity	Unit Quantity	Unit Cost	Cost		Total	\$678,000
26								
27	Flow rate and PRV Valve w/ Check Valve feature - 16"	10	ea	\$30,000.00	\$300,000.00			
28	Butterfly Valve - 16"	10	ea	\$6,000.00	\$60,000.00			
29	Manifold Piping - 16" to 36" dia. Steel pipe	36,000	lb.	\$1.50	\$54,000.00			
30	Manifold Fabrication	36,000	lb.	\$2.00	\$72,000.00			
31	Concrete slab and encasement	40	cy	\$600.00	\$24,000.00			
32	Earthwork/site work	1	L.S.	\$5,000.00	\$5,000.00			
33	Electrical/Control system	1	L.S.	\$40,000.00	\$40,000.00			
34	Fence	1	L.S.	\$3,000.00	\$3,000.00			
35	Main Pipe 63" dia crossing under plant	100	I.f.	\$1,200.00	\$120,000.00			
36								
37	Bifurcation Structure at Plant #2						Total	\$60,000
38								
39	Isolation Valves - 24"	2	ea	\$10,000.00	\$20,000.00			
40	Isolation Valves - 36"	2	ea	\$20,000.00	\$40,000.00			
41								
42								
43								
44	Turnout and Crossing Pumping Plant 3 (MP 22.5)	Quantity	Unit Quantity	Unit Cost	Cost		Total	\$693,000
45								
46	Flow rate and PRV Valve w/ Check Valve feature - 16"	10	ea	\$30,000.00	\$300,000.00			
47	Butterfly Valve - 16"	10	ea	\$6,000.00	\$60,000.00			
48	Manifold Piping - 16" to 36" dia. Steel pipe	36,000	lb.	\$1.50	\$54,000.00			
49	Manifold Fabrication	36,000	lb.	\$2.00	\$72,000.00			
50	Concrete slab and encasement	40	cy	\$600.00	\$24,000.00			
51	Earthwork/site work	1	L.S.	\$5,000.00	\$5,000.00			
52	Electrical/Control system	1	L.S.	\$40,000.00	\$40,000.00			
53	Fence	1	L.S.	\$3,000.00	\$3,000.00			
54	Main Pipe 78" dia crossing under plant	100	I.f.	\$1,350.00	\$135,000.00			

55								
56	Bifurcation Structure at Plant #3						Total	\$60,000
57	Valves							
58	Isolation Valves - 24"	2	ea	\$10,000.00	\$20,000.00			
59	Isolation Valves - 36"	2	ea	\$20,000.00	\$40,000.00			
60								
61	Earthwork (CY)							
62	Excavation						Total	\$2,915,046
63	Diameter	Length	Unit Quantity	Quantity	Unit Cost	Cost		
64	78	1,000.00	11.47	11,470	\$5.00	\$57,350		
65	78	14,769.50	11.47	169,406	\$5.00	\$847,031		
66	75	14,769.50	10.94	161,578	\$5.00	\$807,892		
67	63	10,234.11	8.94	91,493	\$5.00	\$457,465		
68	63	10,234.12	8.94	91,493	\$5.00	\$457,465		
69	60	6,796.77	8.47	57,569	\$5.00	\$287,843		
70								
71								
72	Total							
73								
74	Bedding						Total	\$262,140
75	Diameter	Length	Unit Quantity	Quantity	Unit Cost	Cost		
76	78	1,000.00	0.20	196	\$25.00	\$4,900		
77	78	14,769.50	0.20	2,895	\$25.00	\$72,371		
78	75	14,769.50	0.19	2,821	\$25.00	\$70,524		
79	63	10,234.11	0.17	1,730	\$25.00	\$43,239		
80	63	10,234.12	0.17	1,730	\$25.00	\$43,239		
81	60	6,796.77	0.16	1,115	\$25.00	\$27,867		
82								
83								
84								
85	Embedment (.7)						Total	\$2,834,644
86	Diameter	Length	Unit Quantity	Quantity	Unit Cost	Cost		
87	78	1,000.00	2.34	2,340	\$25.00	\$58,500		
88	78	14,769.50	2.34	34,561	\$25.00	\$864,016		
89	75	14,769.50	2.19	32,375	\$25.00	\$809,369		
90	63	10,234.11	1.65	16,876	\$25.00	\$421,901		
91	63	10,234.12	1.65	16,876	\$25.00	\$421,902		
92	60	6,796.77	1.52	10,358	\$25.00	\$258,957		
93								
94								
95								
96								
97	Compacted Backfill						Total	\$2,283,720
98	Diameter	Length	Unit Quantity	Quantity	Unit Cost	Cost		
99	78	1,000.00	7.26	7,262	\$6.00	\$43,572		
100	78	14,769.50	7.26	107,256	\$6.00	\$643,537		
101	75	14,769.50	7.00	103,387	\$6.00	\$620,319		
102	63	10,234.11	6.03	61,681	\$6.00	\$370,086		
103	63	10,234.12	6.03	61,681	\$6.00	\$370,086		
104	60	6,796.77	5.79	39,353	\$6.00	\$236,120		
105								
106								
107								
108								
109	Farm Turnout Tees and Valves						Total	\$174,060
110	Size	Quantity	Unit Cost	Cost				
111	in	ea	\$/ea	\$				
112								
113	8	6	\$2,770.00	\$16,620.00				
114	6	24	\$2,300.00	\$55,200.00				
115	4	24	\$1,810.00	\$43,440.00				
116	2	2	\$1,400.00	\$2,800.00				
117	Installation	56	\$1,000.00	\$56,000.00				
118								
119	PRV and Valve Vaults						Total	\$862,000
120	Size	Quantity	Unit Cost	Cost				
121	in	ea	\$/ea	\$				
122								
123	8	6	\$17,000.00	\$102,000.00				
124	6	24	\$14,000.00	\$336,000.00				
125	4	24	\$12,000.00	\$288,000.00				
126	2	2	\$12,000.00	\$24,000.00				
127	Installation	56	\$2,000.00	\$112,000.00				
128								
129								
130	Flow Meters and Precast Vaults						Total	\$149,500
131	Size	Quantity	Unit Cost	Cost				

132	in	ea	\$/ea	\$				
133								
134	8	3	\$5,500.00	\$16,500.00				
135	6	12	\$4,500.00	\$54,000.00				
136	4	12	\$4,000.00	\$48,000.00				
137	2	1	\$3,000.00	\$3,000.00				
138	Installation	28	\$1,000.00	\$28,000.00				
139								
140	Steel Pipe Xings for Turnouts						Total	\$643,500
141	Size	Quantity	Unit Cost	Cost				
142	Steel Pipe Xings - 10"	3	\$27,000.00	\$81,000.00				
143	Steel Pipe Xings - 6"	25	\$22,500.00	\$562,500.00				
144								
145	Road crossings	Quantity	Unit Cost	Cost			Total	\$180,000
146	Hwy 24	1	L.S.	\$30,000.00				
147	34+00	1	L.S.	\$10,000.00				
148	147+00	1	L.S.	\$10,000.00				
149	178+00	1	L.S.	\$10,000.00				
150	210+00	1	L.S.	\$10,000.00				
151	263+00	1	L.S.	\$10,000.00				
152	404+00	1	L.S.	\$10,000.00				
153	422+50	1	L.S.	\$10,000.00				
154	441+00	1	L.S.	\$10,000.00				
155	450+00	1	L.S.	\$10,000.00				
156	467+00	1	L.S.	\$10,000.00				
157	484+00 - Terrace Height Blvd.	1	L.S.	\$30,000.00				
158	495+00	1	L.S.	\$10,000.00				
159	508+00	1	L.S.	\$10,000.00				
160								
161	ah-Moxee/Union Gap Drop Structure						Total	\$937,879
162	Upstream Shutoff Valve, 36" BFV	2	ea	\$20,000.00	\$40,000.00			
163	Road crossings	3	ea	\$10,000.00	\$30,000.00			
164	Pipe 33" - Union Gap, 550'	61847.5	l.f.	\$2.00	\$123,695.00			
165	Pipe 36" - Selah-Moxee, 100'	11912	l.f.	\$2.00	\$23,824.00			
166	Flow rate and PRV Valve w/ Check Valve feature - 16"	16	ea	\$30,000.00	\$480,000.00			
167	Butterfly Valve - 16"	16	ea	\$6,000.00	\$96,000.00			
168	Manifold Piping - 16" to 36" dia. Steel pipes	30000	lb.	\$3.00	\$90,000.00			
169	Concrete Outlet Boxes	60	cy	\$700.00	\$42,000.00			
170	Safety Racks (6x10)	2800	lb	\$4.00	\$11,200.00			
171	Excavation	100	cy	\$8.00	\$800.00			
172	Compacted Backfill	30	cy	\$12.00	\$360.00			
173								
174								
175								
176								
177								
178	Special Structures							
179	Access Manholes, Airvalves (every 2000')	30	ea	\$14,000.00			Total	\$420,000
180								
181	Fence Replacement	50000	l.f.	\$3.00			Total	\$150,000
182								
183								
184								
185								
186	SCADA	L.S.	\$460,000.00				Total	\$460,000
187								
188	Subtotal w/o Mobilization							\$74,168,123
189	Mobilization 5%							\$3,800,000
190	Subtotal w/ Mobilization							\$77,968,123
191	Unlisted 15%							\$11,695,218
192	CONTRACT COST							\$90,000,000
193	Construction Contingences 25%							\$23,000,000
194	FIELD COST							\$113,000,000
195								
196								
197	Right-of-Way	90	acres	\$2,500.00			Total	\$225,000
198								
199								
200								



Project: Black Rock Project Assessment  
Feature: Delivery System to Roza Irrigation District  
Details: Plan 5 - Reverse Flow and Relift Stations

By: Wendy Christensen

Checked by: John Manfredi

Item	Schedule							
1	Pump Station #1 (MP 20.6) - 256 cfs						Total	\$948,200
2	Item	Quantity	Unit	Unit Cost	Cost			
3								
4	Concrete - plant and check structure	180	cy	\$700.00	\$126,000			
5	Trashrack (12 x 60)	15000	lb	\$4.00	\$60,000			
6	Excavation	1000	cy	\$8.00	\$8,000			
7	Compacted Backfill	300	cy	\$12.00	\$3,600			
8	110 hp vertical propeller pumps - fixed	4	ea	\$82,500.00	\$330,000			
9	110 hp vertical propeller pumps -vfd	2	ea	\$91,300.00	\$182,600			
10	Manifold	20000	lb	\$3.00	\$60,000			
11	24" Check Valves	6	ea	\$20,000.00	\$120,000			
12	24" Butterfly Valves	6	ea	\$5,000.00	\$30,000			
13	Power supply	1	L.S.	\$25,000.00	\$25,000			
14	Walkway	150	ft <sup>2</sup>	\$20.00	\$3,000			
15								
16								
17	Pump Station #2 (MP 18.7) - 240 cfs						Total	\$901,600
18								
19								
20	Concrete - plant and check structure	180	cy	\$700.00	\$126,000			
21	Trashrack (12 x 60)	15000	lb	\$4.00	\$60,000			
22	Excavation	1000	cy	\$8.00	\$8,000			
23	Compacted Backfill	300	cy	\$12.00	\$3,600			
24	100 hp vertical propeller pumps - fixed	4	ea	\$75,000.00	\$300,000			
25	100 hp vertical propeller pumps -vfd	2	ea	\$83,000.00	\$166,000			
26	Manifold	20000	lb	\$3.00	\$60,000			
27	24" Check Valves	6	ea	\$20,000.00	\$120,000			
28	24" Butterfly Valves	6	ea	\$5,000.00	\$30,000			
29	Power supply	1	L.S.	\$25,000.00	\$25,000			
30	Walkway	150	ft <sup>2</sup>	\$20.00	\$3,000			
31								
32								
33								
34								
35	Pump Station #3 (MP 16.8) - 236 cfs						Total	\$862,400
36								
37								
38	Concrete - plant and check structure	180	cy	\$700.00	\$126,000			
39	Trashrack (12 x 50)	12000	lb	\$4.00	\$48,000			
40	Excavation	800	cy	\$8.00	\$6,400			
41	Compacted Backfill	250	cy	\$12.00	\$3,000			
42	100 hp vertical propeller pumps - fixed	4	ea	\$75,000.00	\$300,000			
43	100 hp vertical propeller pumps -vfd	2	ea	\$83,000.00	\$166,000			
44	Manifold	20000	lb	\$3.00	\$60,000			
45	24" Check Valves	6	ea	\$20,000.00	\$120,000			
46	24" Butterfly Valves	6	ea	\$5,000.00	\$30,000			
47	Walkway	150	ft <sup>2</sup>	\$20.00	\$3,000			
48								
49								
50								
51								
52	Pump Station #4 (MP 13) - 156 cfs						Total	\$631,750
53								
54								
55	Concrete - plant and check structure	120	cy	\$700.00	\$84,000			
56	Trashrack (12 x 50)	12000	lb	\$4.00	\$48,000			
57	Excavation	800	cy	\$8.00	\$6,400			
58	Compacted Backfill	250	cy	\$12.00	\$3,000			
59	85 hp vertical propeller pumps - fixed	3	ea	\$63,750.00	\$191,250			
60	85 hp vertical propeller pumps -vfd	2	ea	\$70,550.00	\$141,100			
61	Manifold	15000	lb	\$3.00	\$45,000			
62	18" Check Valves	5	ea	\$18,000.00	\$90,000			
63	18" Butterfly Valves	5	ea	\$4,000.00	\$20,000			
64	Walkway	150	ft <sup>2</sup>	\$20.00	\$3,000			
65								
66								
67	Selah-Moxee/Union Gap Drop Structure						Total	\$459,640
68								
69	Road crossings	3	ea	\$10,000.00	\$30,000			
70	Pipe 33" - Union Gap	550	l.f.	\$180.00	\$99,000			
71	Pipe 36" - Selah-Moxee	100	l.f.	\$200.00	\$20,000			
72	Upstream Gate Structure Concrete	120	cy	\$700.00	\$84,000			

73	Trash racks (12x24)	16000	lb.	\$4.00	\$64,000			
74	Slide gates/operators	4	ea	\$20,000.00	\$80,000			
75	Concrete Baffled Outlets	100	cy	\$700.00	\$70,000			
76	Safety Racks (6 x 10)	2800	lb	\$4.00	\$11,200			
77	Excavation	120	cy	\$8.00	\$960			
78	Compacted Backfill	40	cy	\$12.00	\$480			
79								
80	Terminal check	30.00	cy	700			Total	\$21,000
81								
82								
83	SCADA	L.S.	\$300,000.00				Total	\$300,000
84								
85	-- Subtotal w/o Mobilization							\$4,124,590
86	Mobilization 5%							\$210,000
87	Subtotal w/ Mobilization							\$4,334,590
88	Unlisted 15%							\$650,189
89	CONTRACT COST							\$5,000,000
90	Construction Contingences 25%							\$1,250,000
91	FIELD COST							\$6,300,000
92								
93								
94	Right-of-Way	10	acres	\$2,500.00			Total	\$25,000
95								